

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

IN THE CLAIMS:

1. (currently amended) An epoxy resin composition for carbon-fiber-reinforced composite materials, comprising the following components [A], [B], [C], and [D] and [E]:

[A] epoxy resin,
[B] amine curing agent which is dicyandiamide,
[C] phosphorus compound,
[D] curing accelerator which is 1,1'-(4-methyl-m-phenylene)bis(3,3-dimethylurea) and, optionally,
[E] a thermoplastic resin;

wherein the concentration of the component [C] is 0.2 to 15% by weight in terms of phosphorus atom concentration;

and wherein a content of a compound other than the components [A], [B], [C], [D], and the optional thermoplastic resin [E] in the epoxy resin composition is [[5%]] more than 95% by weight or less.

2. (original) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, characterized in that the viscosity of the composition is 10 to 700 Pa·s at 60°C.

3. (previously presented) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1,

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

**PATENT
FINAL**

characterized by comprising red phosphorus as the component [C].

4. (original) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 3, characterized in that the red phosphorus is coated with a metal hydroxide and/or a resin.

5 - 9. (canceled)

10. (canceled)

11. (previously presented) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, characterized in that the specific gravity of the composition is 1.35 or lower.

12. (previously presented) The epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1, characterized in that the composition can be cured within 30 minutes at 150°C.

13. (previously presented) A prepreg, prepared by impregnating

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

carbon fiber with the epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1.

14. (original) The prepreg according to claim 13, characterized in that the fiber volume content of a prepreg is 30 to 95%.

15. (previously presented) A fiber-reinforced composite sheet, characterized by comprising a cured resin prepared by curing the epoxy resin composition for carbon-fiber-reinforced composite materials according to claim 1; and carbon fiber.

16. (previously presented) A fiber-reinforced composite sheet, prepared by curing a prepreg according to claim 13.

17. (withdrawn) A carbon-fiber-reinforced composite sheet, characterized in that the thickness of the sheet is 0.05 to 2.0 mm, the flame retardance is UL-94 V-1 or V-0, and the phosphorus atom concentration in the entire composite material is 0.03 to 12% by weight.

18. (withdrawn) An integrated molding, in which a member (I),

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

which comprises a fiber-reinforced composite sheet comprising (a) continuous reinforcing fiber, (b) a matrix resin comprising a thermosetting resin as a major component and (c) a flame-retardant, is joined with another member (II), characterized in that the flame retardance in accordance with UL-94 of the member (I) is V-1 or V-0 for test pieces having a substantial thickness of the member (I).

19. (withdrawn) The integrated molding according to claim 18, wherein the glass transition temperature T_g of (b) the matrix resin comprising a thermosetting resin as a major component satisfies the following equation: $T_{max} - T_g \leq 50$.

20. (withdrawn) The integrated molding according to claim 19, characterized in that (c) the flame-retardant comprises one or more flame-retardants selected from the group consisting of phosphorus, nitrogen and silicon flame-retardants.

21. (withdrawn) The integrated molding according to claim 18, characterized in that (c) the flame-retardant is a phosphorus flame-retardant that comprises phosphorus or a phosphorus compound at a concentration of 0.03 to 12% by weight in terms of phosphorus atom concentration.

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

22. (withdrawn) The integrated molding according to claim 20, characterized in that (c) the flame-retardant is red phosphorus.

23. (withdrawn) The integrated molding according to claim 22, characterized in that the surface of the red phosphorus is coated with a metal hydroxide and/or a resin.

24. (withdrawn) The integrated molding according to claim 18, characterized in that the substantial thickness of the member (I) is 0.05 to 2.0 mm.

25. (withdrawn) The integrated molding according to claim 18, characterized in that the substantial thickness of the member (I) is 0.1 to 1.0 mm.

26. (withdrawn) The integrated molding according to claim 18, characterized in that the substantial thickness of the member (I) is 0.2 to 0.8 mm.

27. (withdrawn) A fiber-reinforced composite sheet (A), comprising (a) continuous reinforcing fiber, (b) a matrix resin comprising a thermosetting resin as a major component and (c) a

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

flame-retardant, characterized in that at least part of the sheet surface has (d) a layer comprising a thermoplastic resin as a major component and the flame retardance in accordance with UL-94 of the sheet is V-1 or V-0 for test pieces having a substantial thickness of the sheet.

28. (withdrawn) The fiber-reinforced composite sheet according to claim 27, wherein the glass transition temperature T_g of (b) the matrix resin comprising a thermosetting resin as a major component satisfies the following equation: $T_{max} - T_g \leq 50$.

29. (withdrawn) The fiber-reinforced composite sheet according to claim 27, characterized in that (c) the flame-retardant comprises one or more flame-retardants selected from the group consisting of phosphorus, nitrogen and silicon flame-retardants.

30. (withdrawn) The fiber-reinforced composite sheet according to claim 27, characterized in that (c) the flame-retardant is a phosphorus flame-retardant that comprises phosphorus or a phosphorus compound at a concentration of 0.03 to 12% by weight in terms of phosphorus atom concentration.

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

**PATENT
FINAL**

31. (withdrawn) The fiber-reinforced composite sheet according to claim 27, characterized in that (c) the flame-retardant is red phosphorus.

32. (withdrawn) The fiber-reinforced composite sheet according to claim 31, characterized in that the surface of the red phosphorus is coated with a metal hydroxide and/or a resin.

33. (withdrawn) The fiber-reinforced composite sheet according to claim 27, characterized in that (b) the matrix resin composition comprising a thermosetting resin as a major component and (d) the thermoplastic resin layer form unevenness at their interface.

34. (withdrawn) The fiber-reinforced composite sheet according to claim 33, wherein of (a) the continuous reinforcing fiber, a plurality of reinforcing fiber groups on (d) the layer side comprising a thermoplastic resin as a major component are embedded in (d) the layer comprising a thermoplastic resin as a major component.

35. (withdrawn) The fiber-reinforced composite sheet according to claim 33, wherein the thickness of (d) the layer comprising a

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

thermoplastic resin as a major component is 10 to 100 μm .

36. (withdrawn) The fiber-reinforced composite sheet according to claim 33, wherein the bonding strength in accordance with ISO4587 of the sheet is 6 MPa or higher at 25°C for test pieces prepared using the fiber-reinforced composite sheet (A) by the process described in the present specification.

37. (withdrawn) The fiber-reinforced composite sheet according to claim 33, characterized in that the flame retardance in accordance with UL-94 of the sheet is V-1 or V-0 for test pieces having a thickness of 0.05 to 2.0 mm.

38. (withdrawn) The fiber-reinforced composite sheet according to claim 33, characterized in that the flame retardance in accordance with UL-94 of the sheet is V-1 or V-0 for test pieces having a thickness of 0.1 to 1.0 mm.

39. (withdrawn) The fiber-reinforced composite sheet according to claim 33, characterized in that the flame retardance in accordance with UL-94 of the sheet is V-1 or V-0 for test pieces having a thickness of 0.2 to 0.8 mm.

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

40. (withdrawn) An integrated molding, characterized in that the fiber-reinforced composite sheet according to claim 27 is joined with another member (II).

41. (withdrawn) The integrated molding according to claim 40, characterized in that the fiber-reinforced composite sheet (A) is joined with another member (II) via (d) the thermoplastic resin layer.

42. (withdrawn) The integrated molding according to claim 40, characterized in that the bonding strength in the vertical direction of the joining portion between the fiber-reinforced composite sheet (A) and another member (II) is 6 MPa or higher at 25°C.

43. (withdrawn) The integrated molding according to claim 18, characterized in that the another member (II) is made up of one or more materials selected from the group consisting of the same material as the member (I) itself, thermoplastic resin compositions and metallic materials.

44. (withdrawn) The integrated molding according to claim 18,

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

characterized in that the member (II) is made up of a red phosphorus-containing nylon compound and the flame retardance in accordance with UL-94 of the member (II) is V-0 for test pieces having the substantial thickness of the member (II).

45. (withdrawn) The integrated molding according to claim 18, characterized in that the member (II) is made up of a thermoplastic resin composition comprising reinforcing fiber.

46. (withdrawn) The integrated molding according to claim 18, characterized in that the continuous reinforcing fiber is carbon fiber.

47. (withdrawn) The integrated molding according to claim 18, characterized in that the thermoplastic resin of (b) the matrix resin composition comprising a thermoplastic resin as a major component is an epoxy resin.

48. (withdrawn) A casing for electrical/electronic equipment comprising the integrated molding according to claim 18.

49. (withdrawn) The casing for electrical/electronic equipment

PATENT APPLN. NO. 10/590,442
RESPONSE UNDER 37 C.F.R. § 1.116

PATENT
FINAL

according to claim 48, characterized in that the electrical/electronic equipment is one or more kinds of equipment selected from the group consisting of note-type personal computers, cellular phones, mobile information terminals, digital cameras, acoustic equipment and electronic storage media.